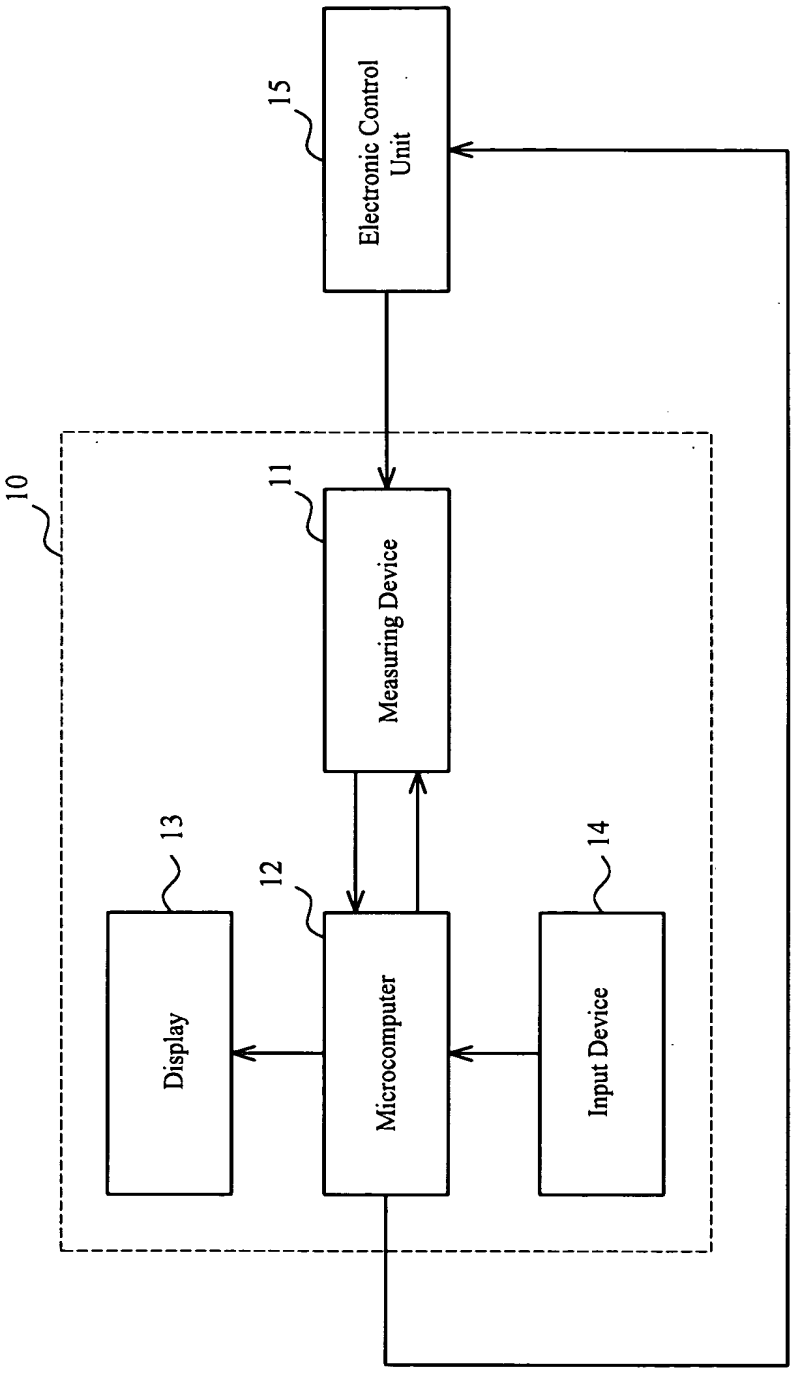

15
Electronic Control Unit
10
11
Measuring Device
13
12
14
Display
Microcomputer
Input Device

Fig.1

Fig.2

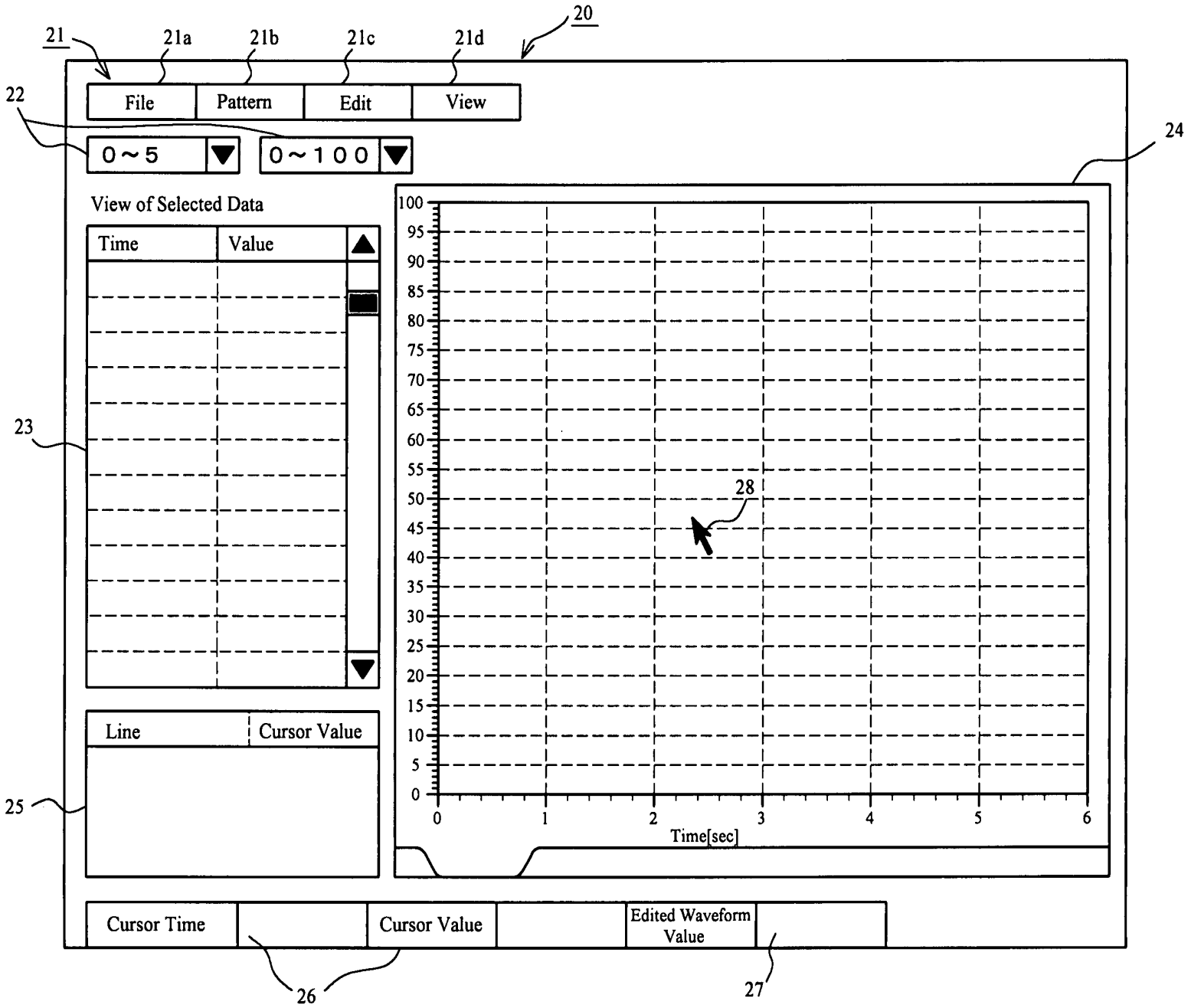

20
21
21a
21b
21c
21d
File
Pattern
Edit
View
22
0~5
0~100
24
View of Selected Data
Time
Value
23
28
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
Time[sec]
Line
Cursor Value
25
Cursor Time
Cursor Value
Edited Waveform Value
26
27

Fig.3

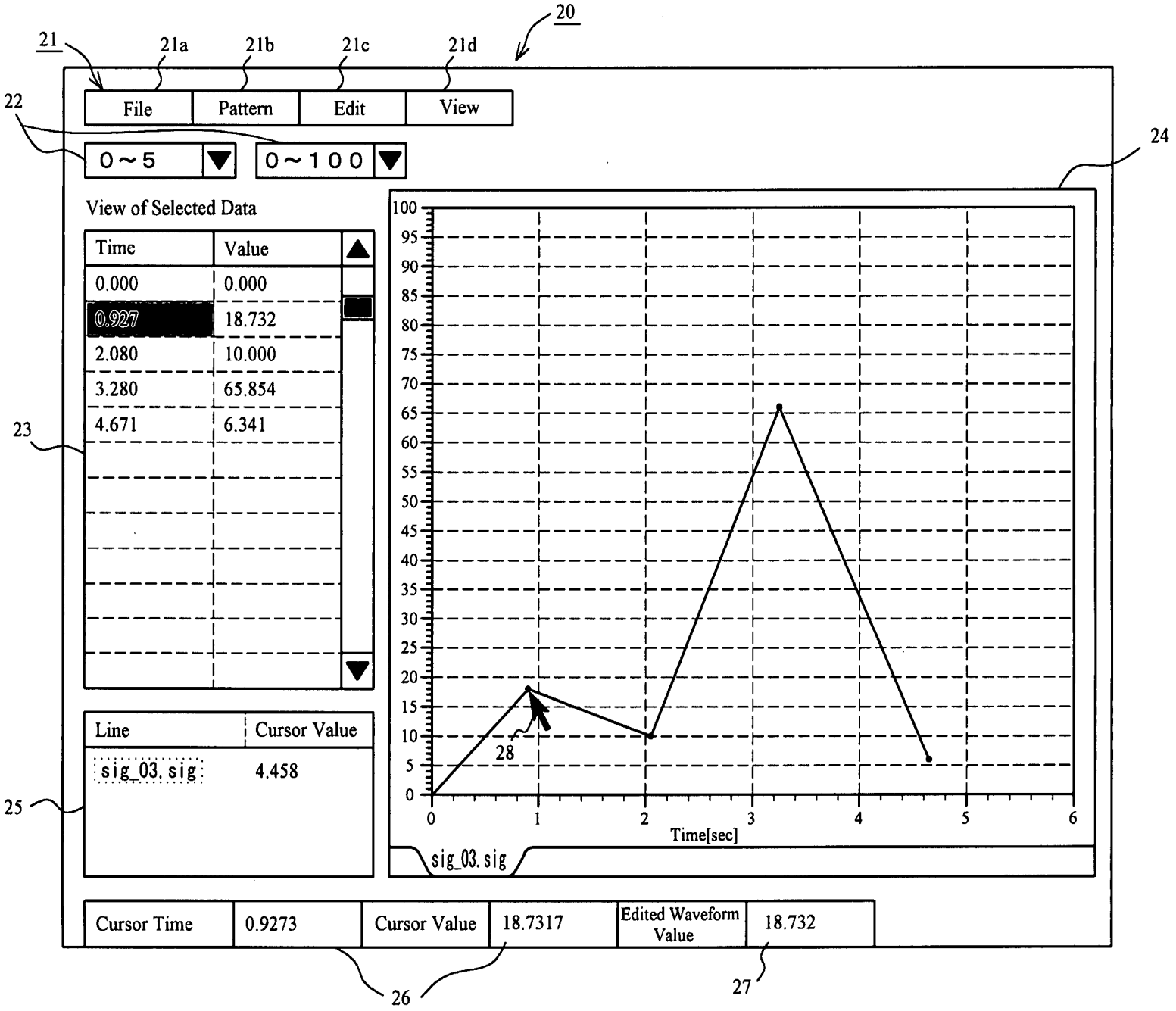

20
21
21a
21b
21c
21d
File
Pattern
Edit
View
22
0～5
0～100
24
View of Selected Data
Time
Value
0.000
0.000
0.927
18.732
2.080
10.000
3.280
65.854
4.671
6.341
23
Line
Cursor Value
sig_03.sig
4.458
25
28
Time[sec]
sig_03.sig
Cursor Time
0.9273
Cursor Value
18.7317
Edited Waveform Value
18.732
26
27

Fig.4(a)

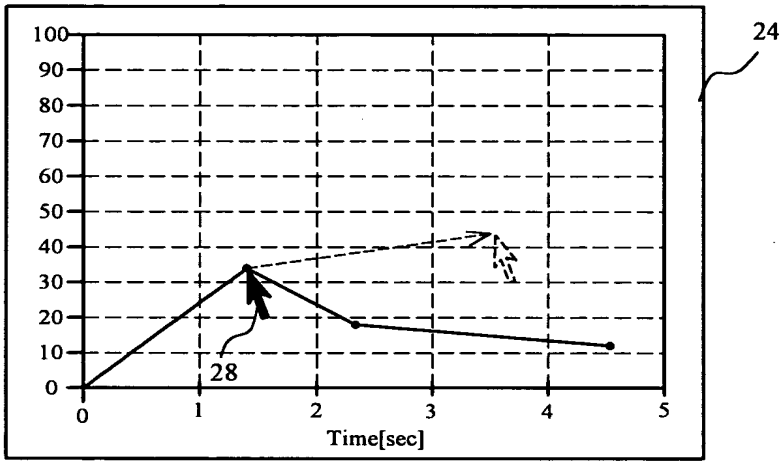

24
100
90
80
70
60
50
40
30
20
10
0
28
0
1
2
3
4
5
Time[sec]

Fig.4(b)

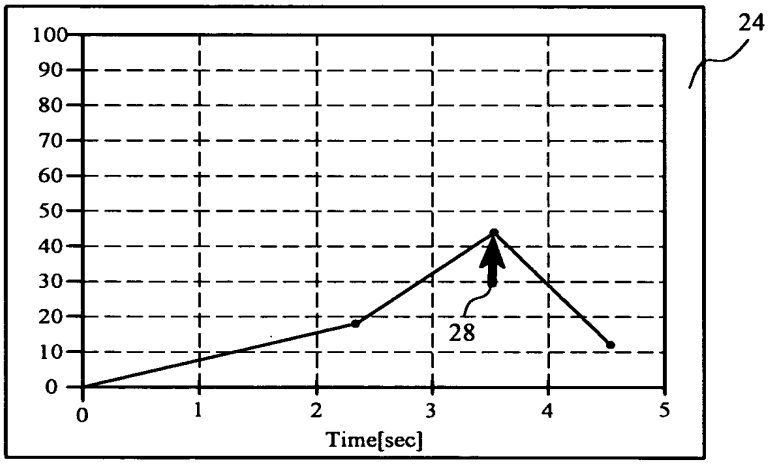

24
100
90
80
70
60
50
40
30
20
10
0
28
0
1
2
3
4
5
Time[sec]

Fig.5(a)

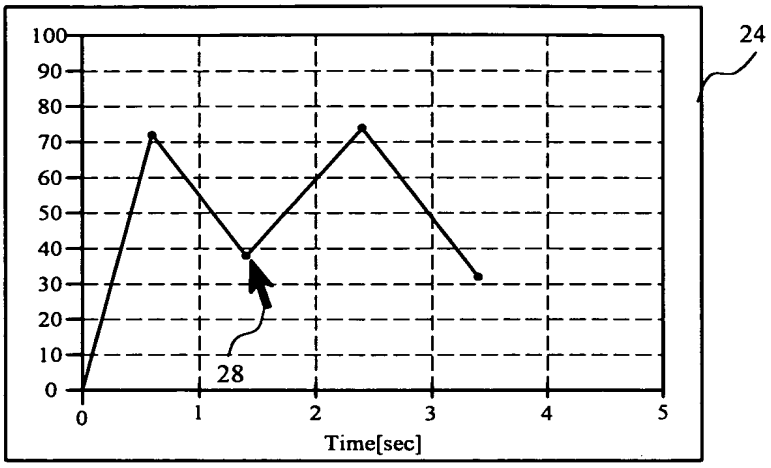


Fig.5(b)

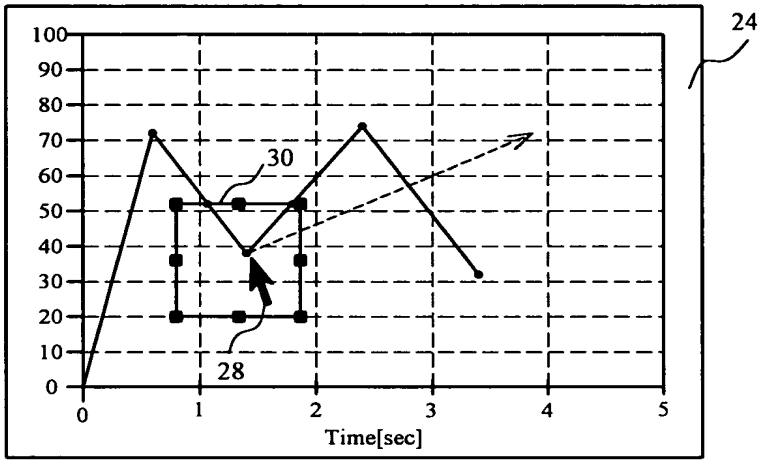


Fig.5(c)

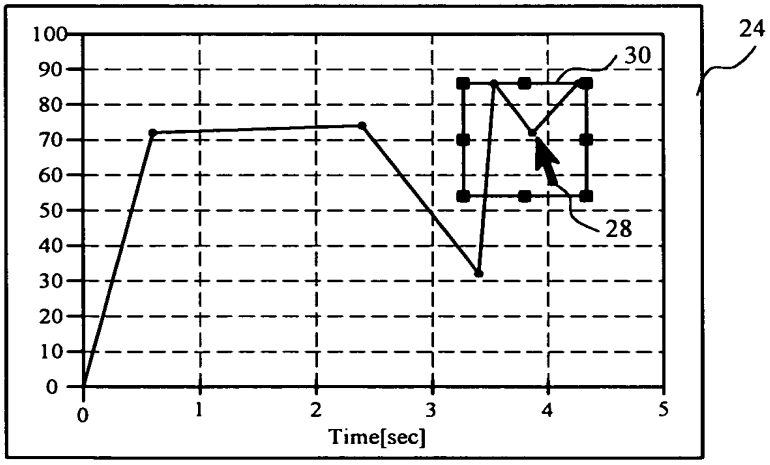


Fig.6(a)

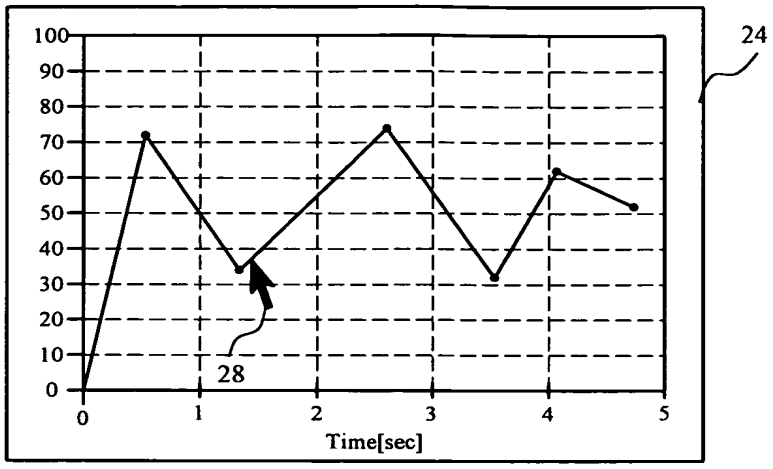


Fig.6(b)

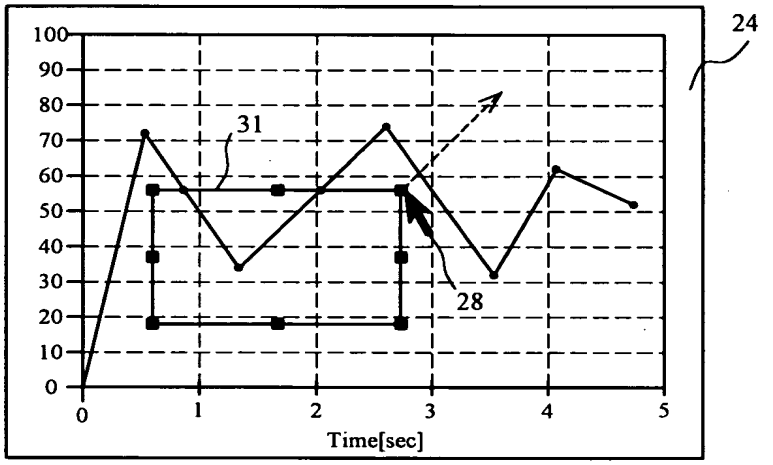


Fig.6(c)

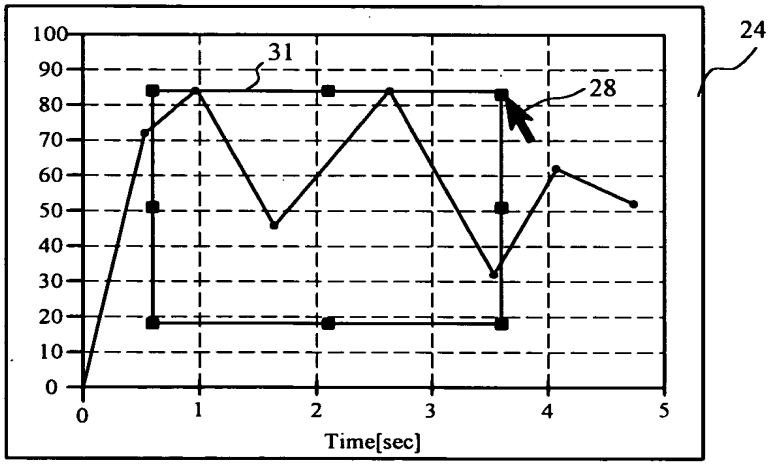


Fig.7(a)

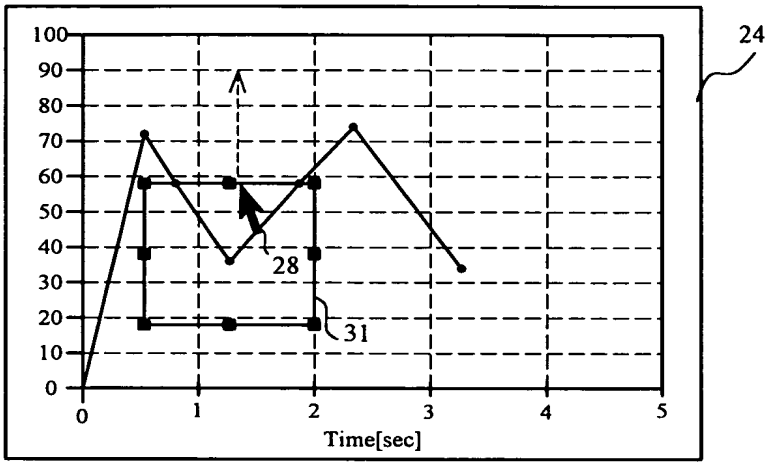

24
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
Time[sec]
28
31

Fig.7(b)

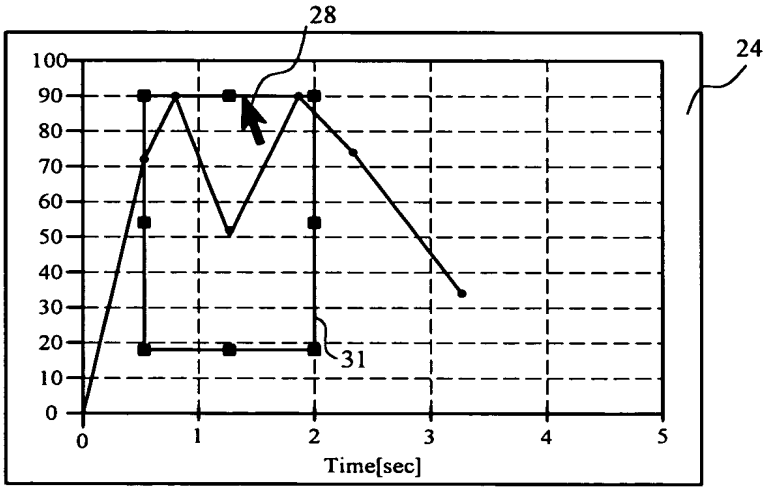

28
24
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
Time[sec]
31

Fig.8(a)

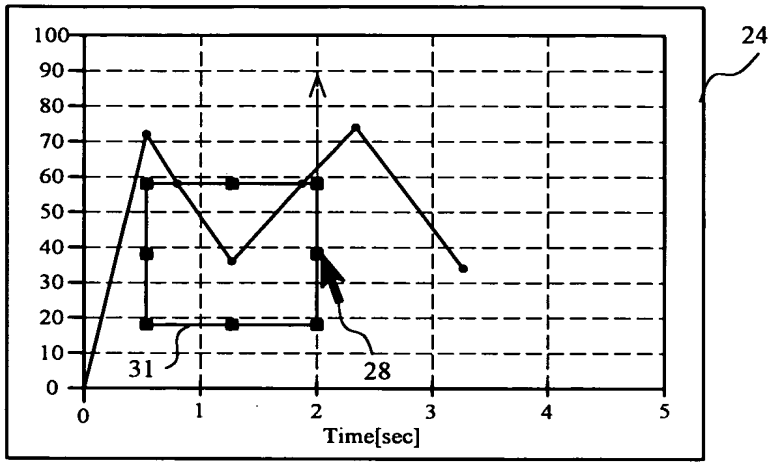

24
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
Time[sec]
31
28

Fig.8(b)

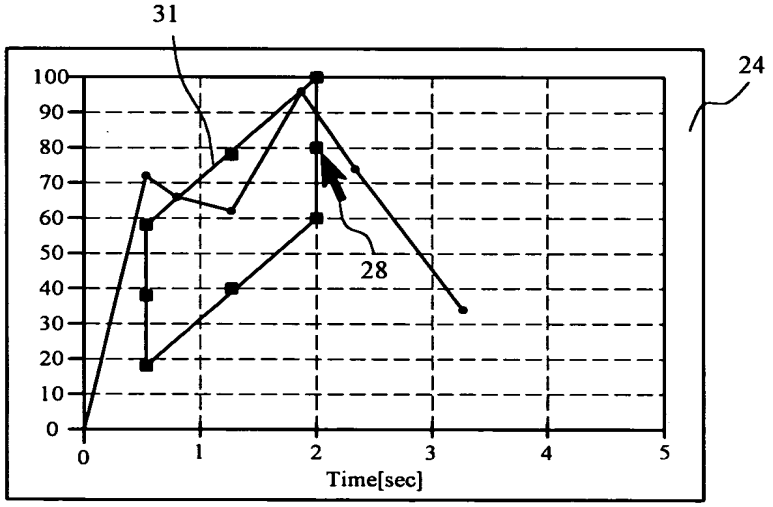

31
24
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
Time[sec]
28

Fig.9(a)

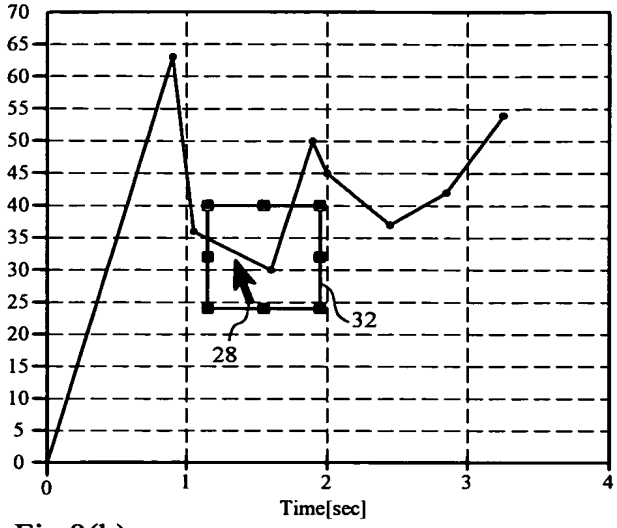


Fig.9(b)

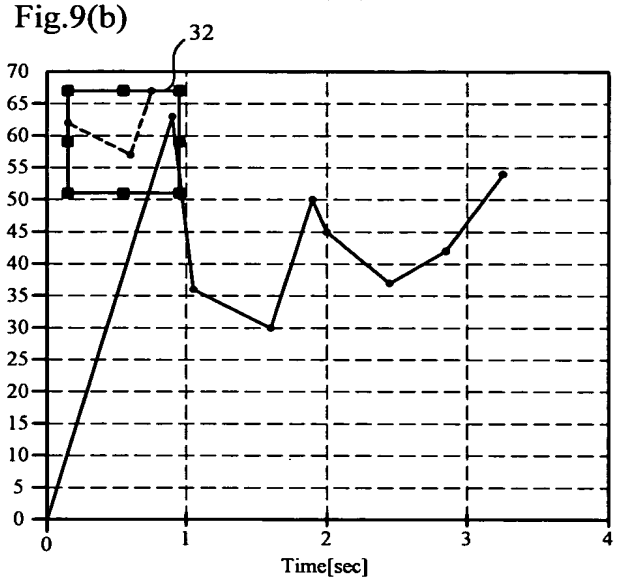


Fig.9(c)

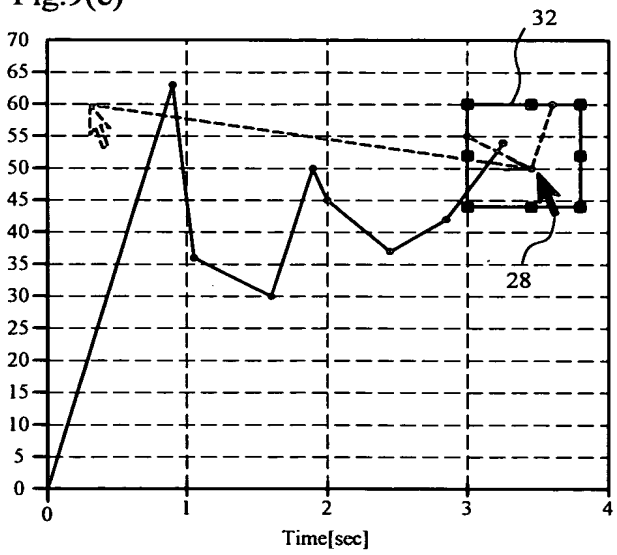


Fig.9(d)

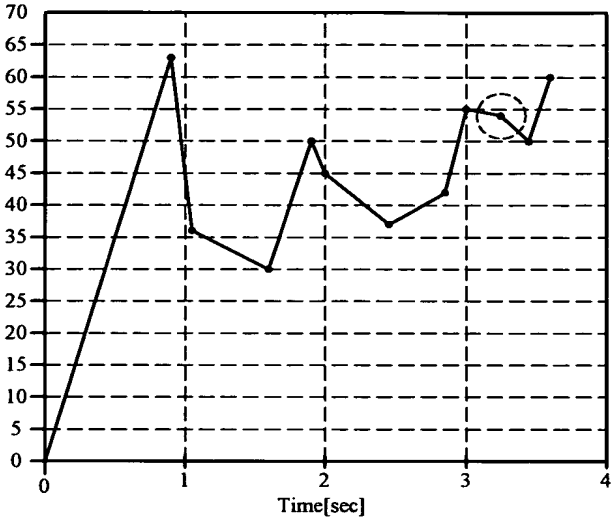


Fig.9(e)

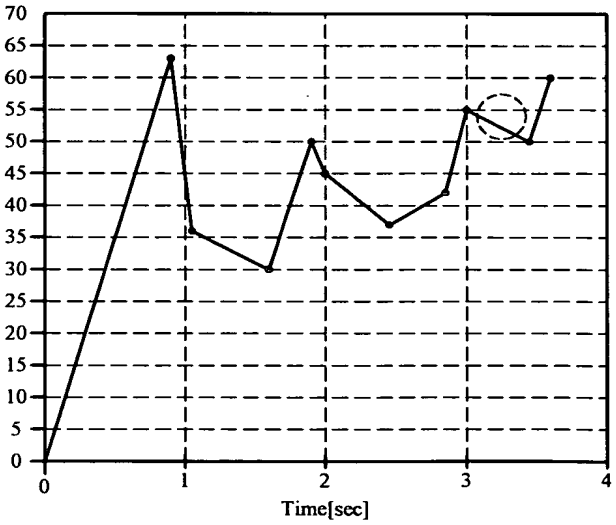


Fig.10

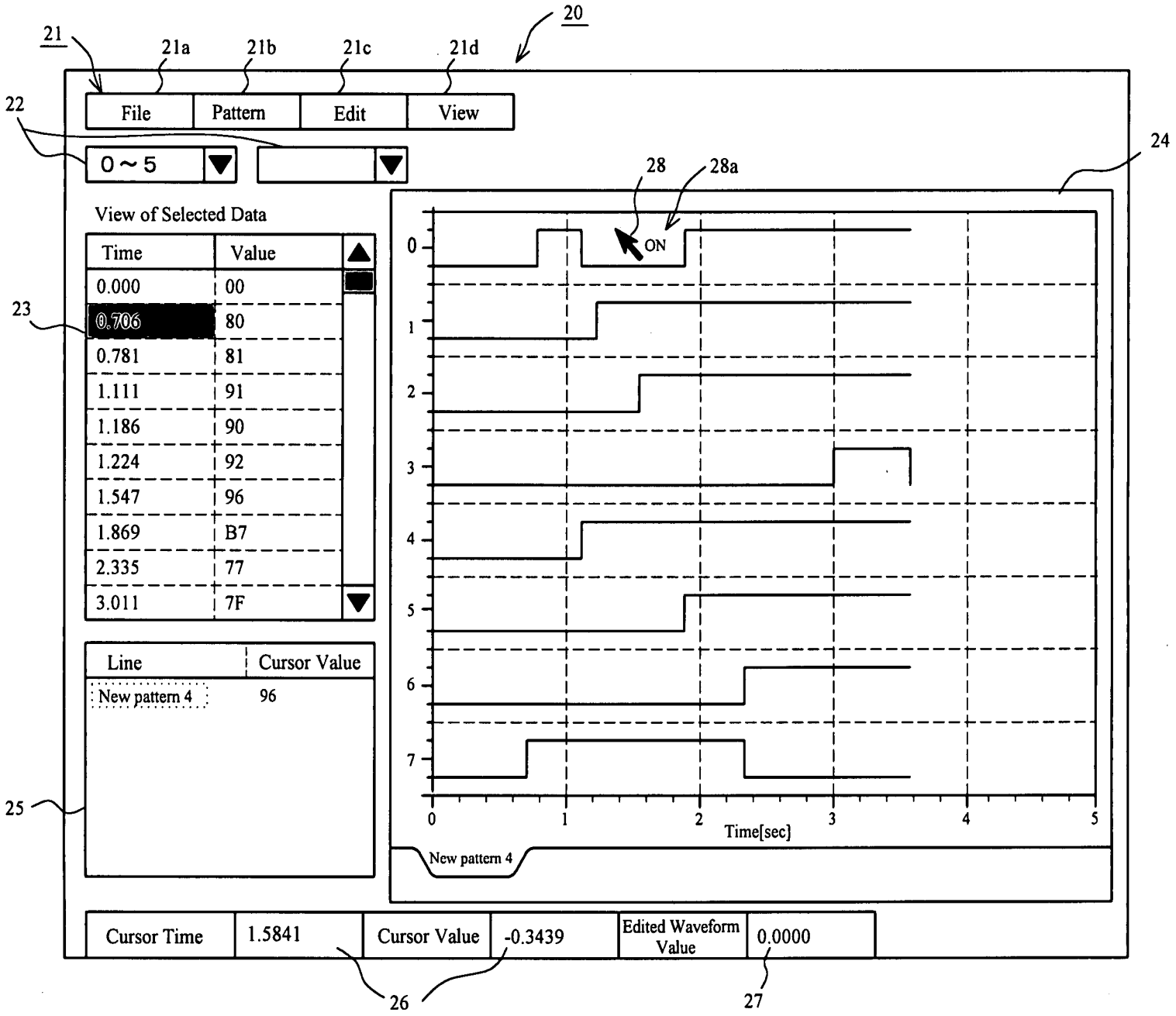

20
21
21a
21b
21c
21d
File
Pattern
Edit
View
22
0 ~ 5
24
28
28a
ON
View of Selected Data
Time
Value
0.000
00
23
0.706
80
0.781
81
1.111
91
1.186
90
1.224
92
1.547
96
1.869
B7
2.335
77
3.011
7F
Line
Cursor Value
New pattern 4
96
25
0
1
2
3
4
5
6
7
Time[sec]
New pattern 4
Cursor Time
1.5841
Cursor Value
-0.3439
Edited Waveform Value
0.0000
26
27

Fig.11(a)

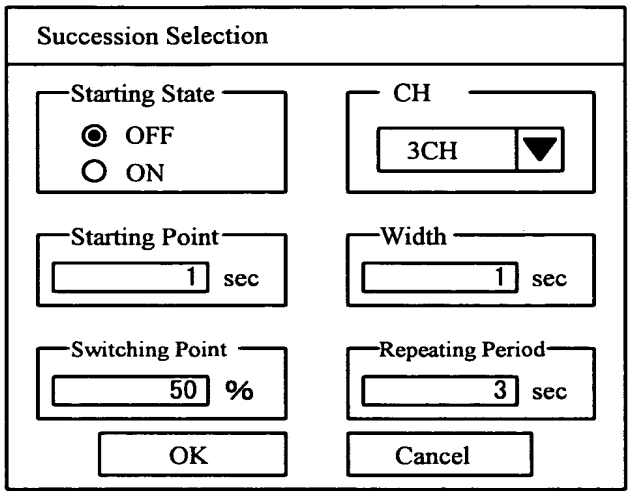


Fig.11(b)

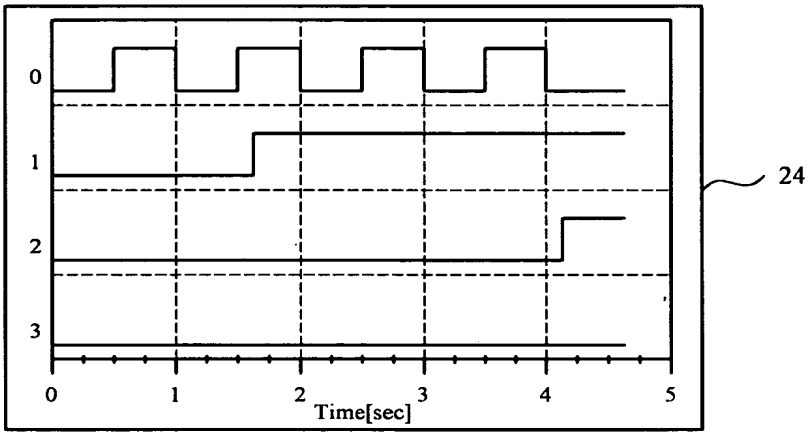
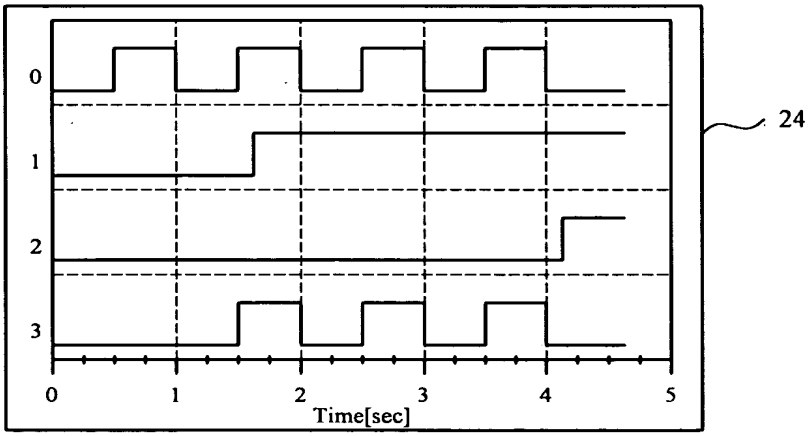


Fig.11(c)



Click Operation

Fig.12(a)

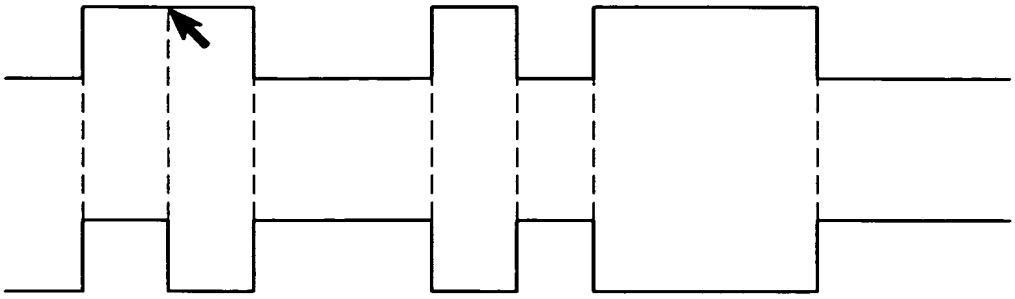


Fig.12(b)

Shift + click Operation

Fig.13(a)

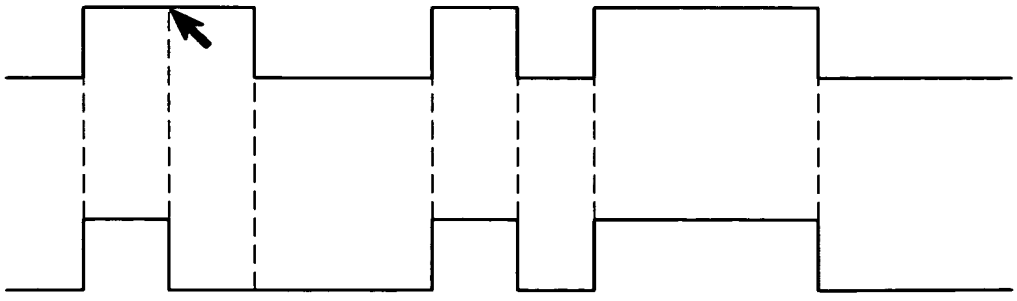


Fig.13(b)

Fig.14(a)

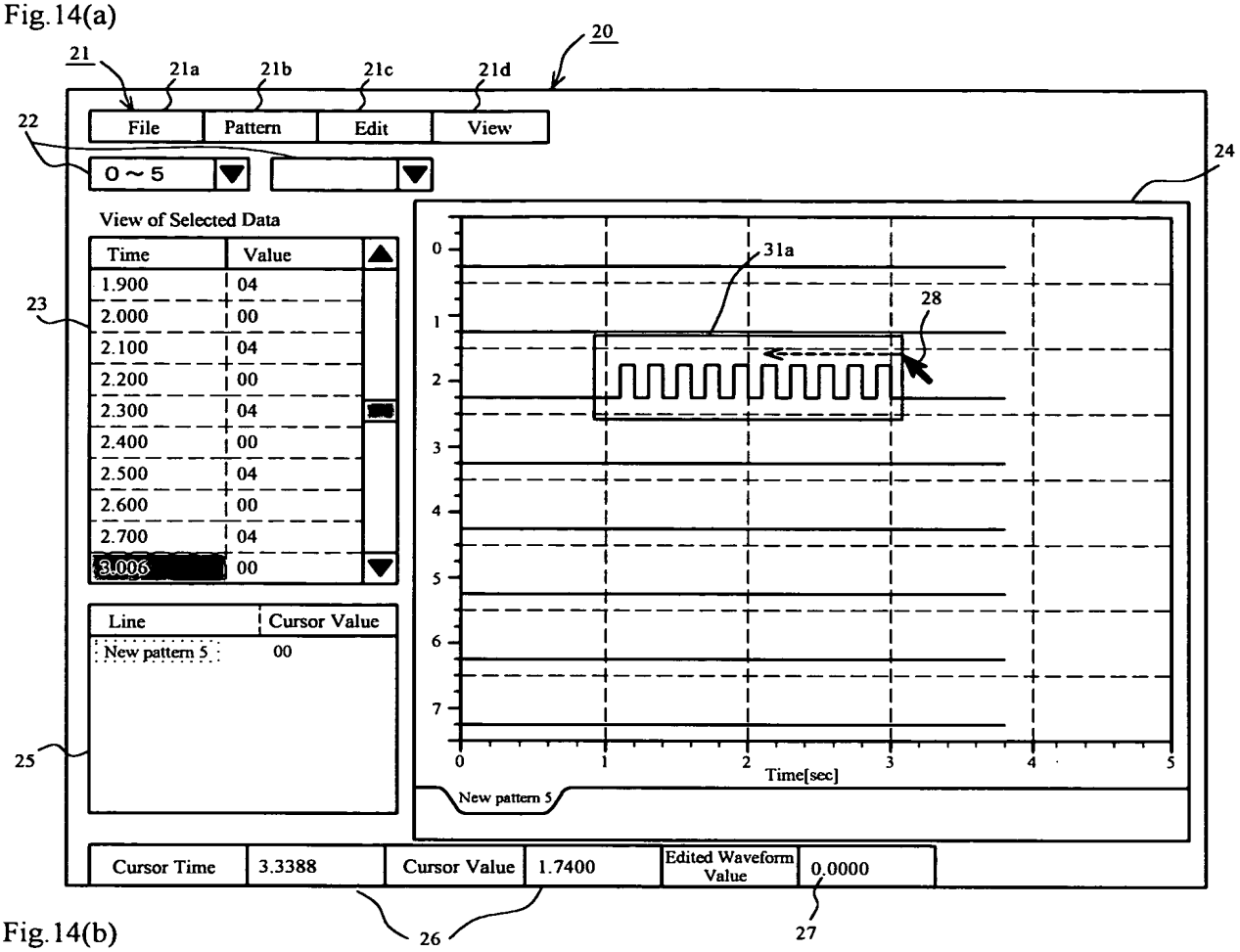


Fig.14(b)

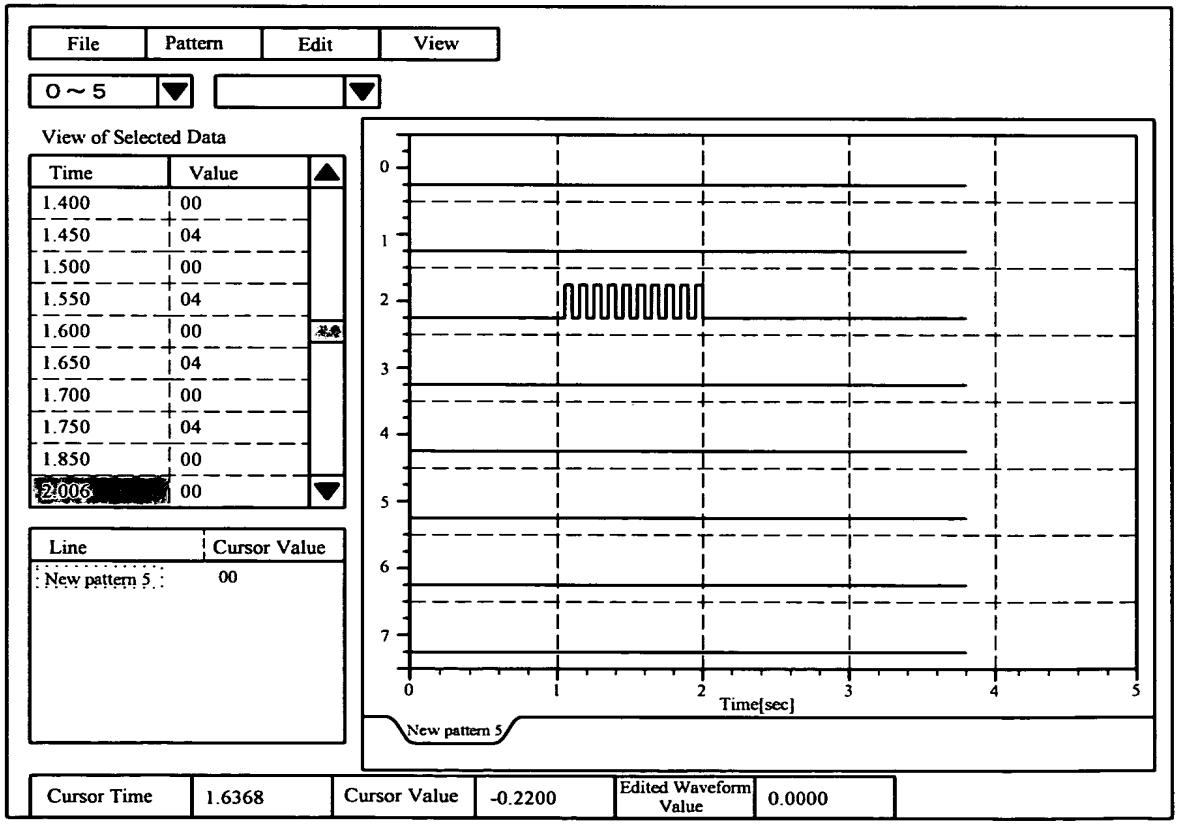


Fig.15

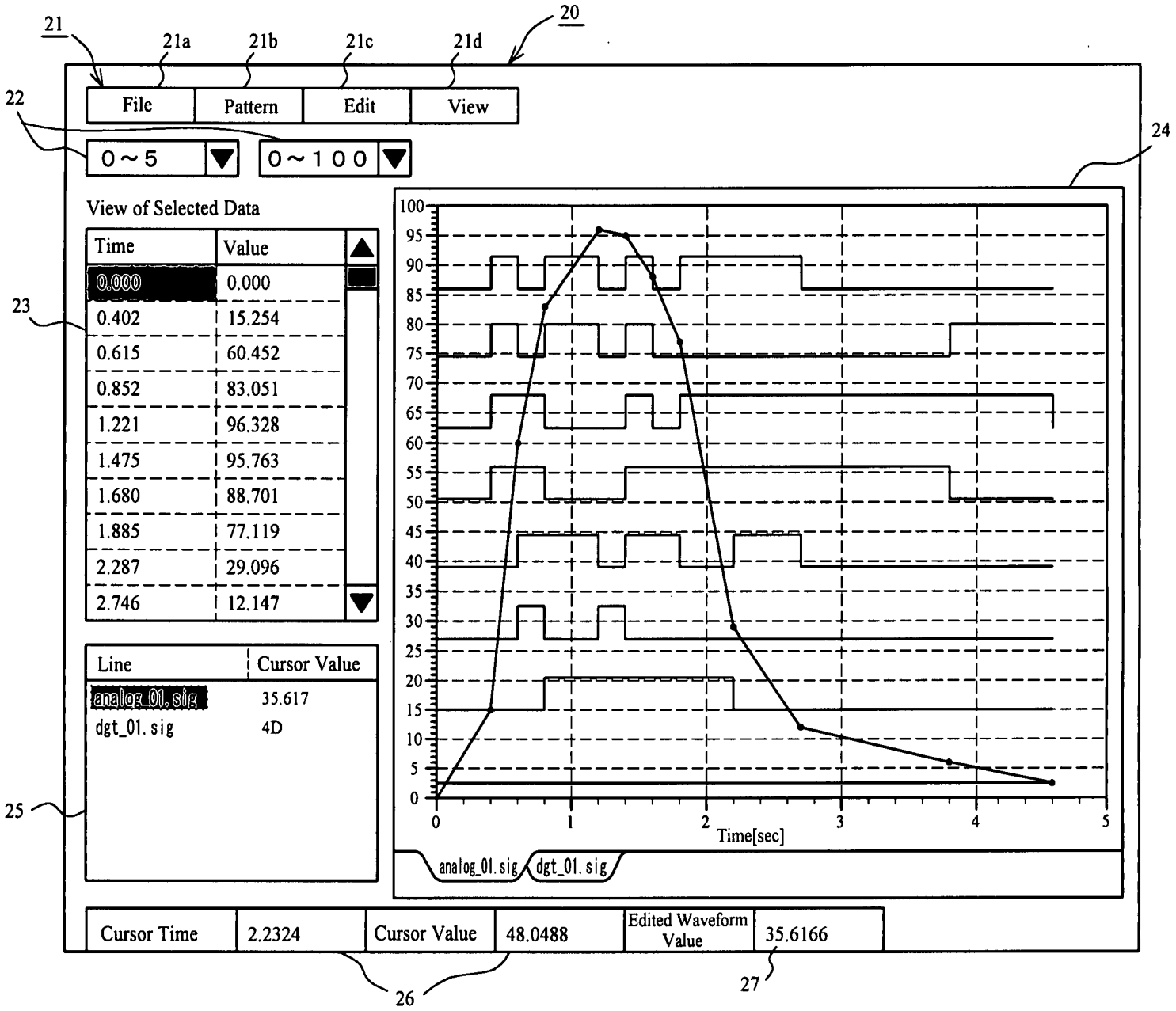

21
21a
21b
21c
21d
20
File
Pattern
Edit
View
22
0～5
0～100
24
View of Selected Data
Time
Value
0.000
0.000
0.402
15.254
0.615
60.452
0.852
83.051
1.221
96.328
1.475
95.763
1.680
88.701
1.885
77.119
2.287
29.096
2.746
12.147
23
Line
Cursor Value
analog_01.sig
35.617
dgt_01.sig
4D
25
Time[sec]
analog_01.sig
dgt_01.sig
Cursor Time
2.2324
Cursor Value
48.0488
Edited Waveform Value
35.6166
26
27

Fig.16

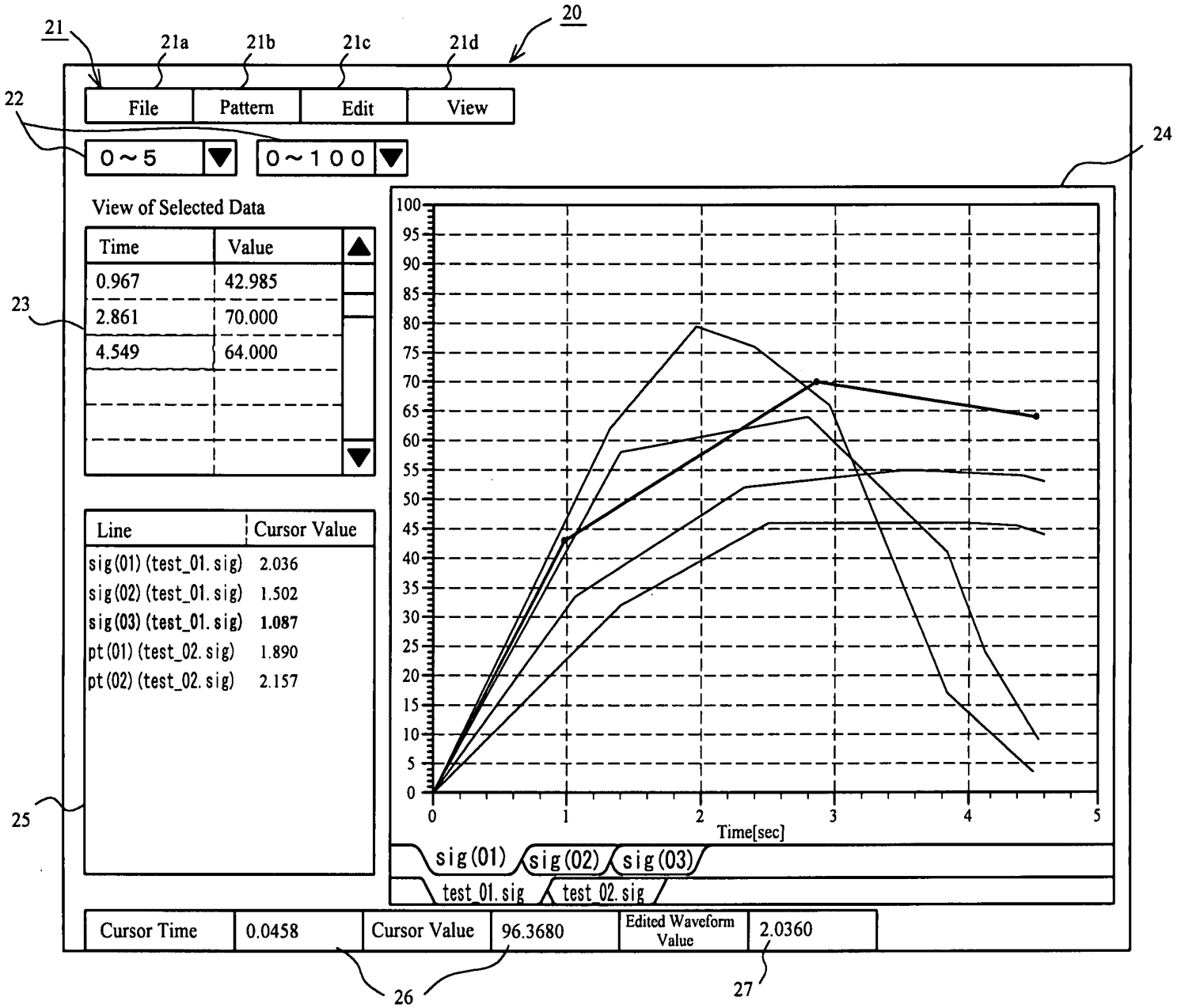

20
21
21a
21b
21c
21d
File
Pattern
Edit
View
22
0～5
0～100
24
View of Selected Data
Time
Value
0.967
42.985
2.861
70.000
4.549
64.000
23
Line
Cursor Value
sig(01) (test_01.sig) 2.036
sig(02) (test_01.sig) 1.502
sig(03) (test_01.sig) 1.087
pt(01) (test_02.sig) 1.890
pt(02) (test_02.sig) 2.157
25
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
Time[sec]
sig(01)
sig(02)
sig(03)
test_01.sig
test_02.sig
Cursor Time
0.0458
Cursor Value
96.3680
Edited Waveform Value
2.0360
26
27

Fig.17

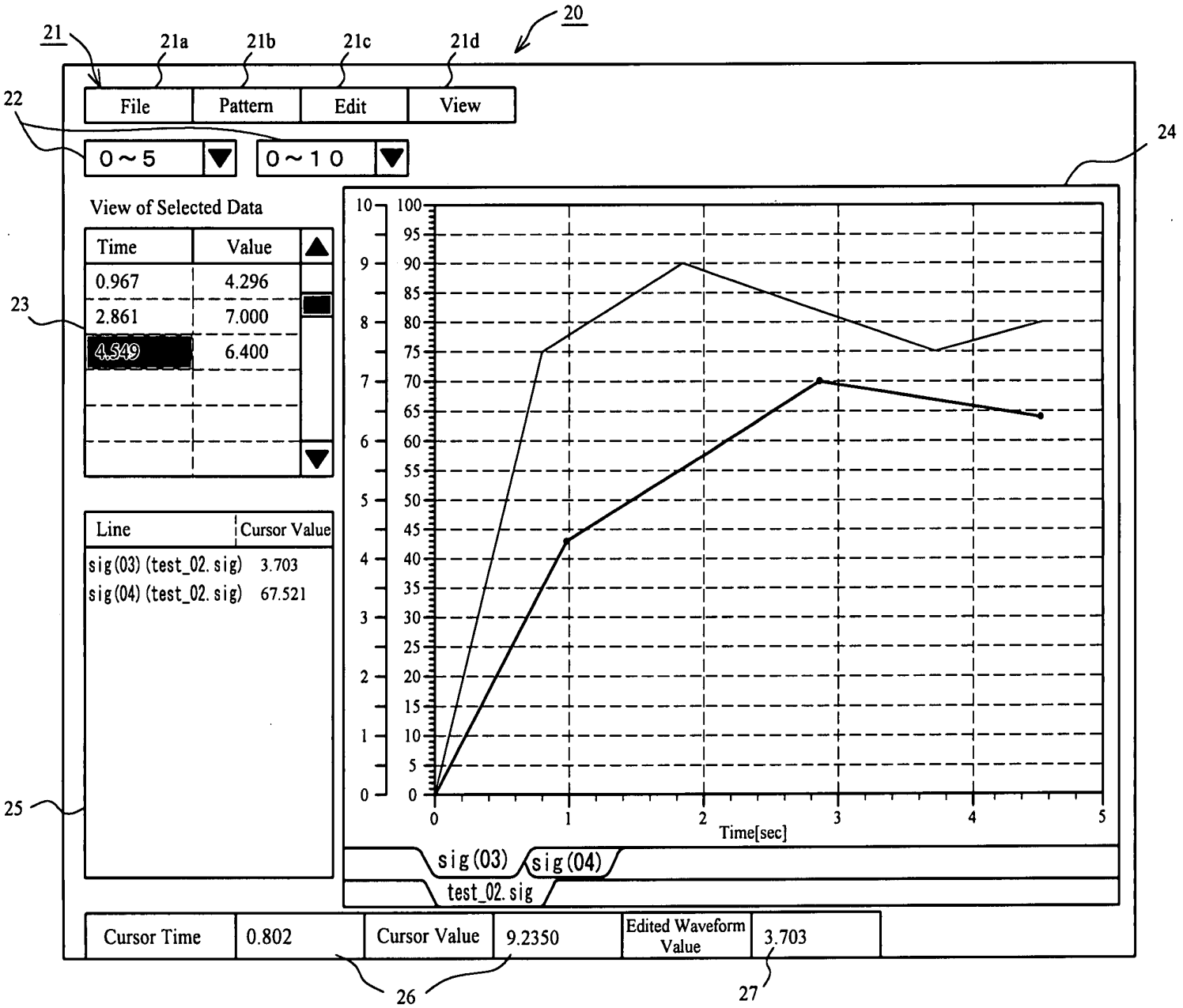

20
21
21a
21b
21c
21d
File
Pattern
Edit
View
22
0～5
0～10
24
View of Selected Data
Time
Value
0.967
4.296
23
2.861
7.000
4.549
6.400
Line
Cursor Value
sig(03) (test_02.sig) 3.703
sig(04) (test_02.sig) 67.521
25
Time[sec]
sig(03)
sig(04)
test_02.sig
Cursor Time
0.802
Cursor Value
9.2350
Edited Waveform Value
3.703
26
27

Fig.18

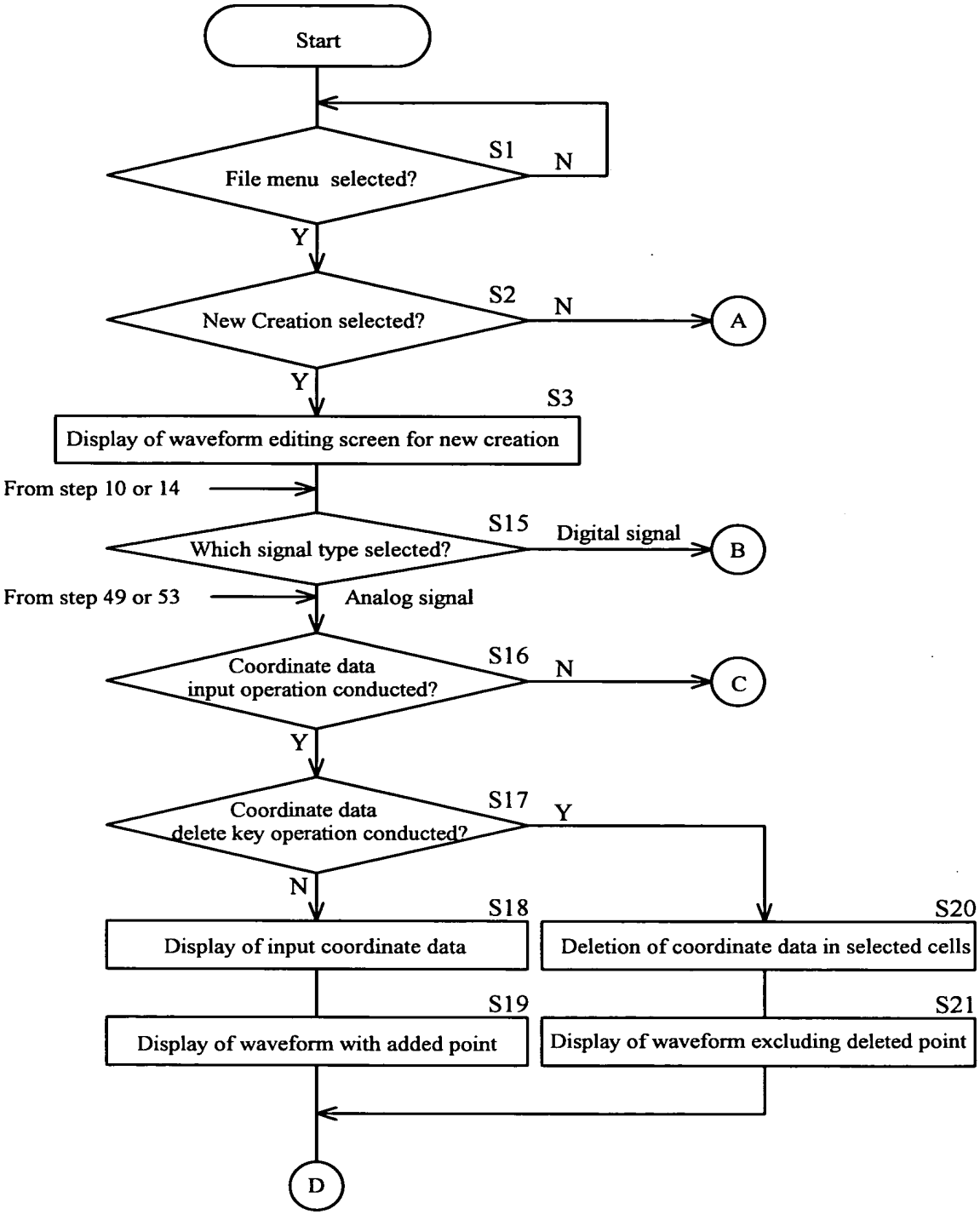

Start
S1
File menu selected?
N
Y
S2
New Creation selected?
N
A
Y
S3
Display of waveform editing screen for new creation
From step 10 or 14
S15
Which signal type selected?
Digital signal
B
From step 49 or 53
Analog signal
S16
Coordinate data input operation conducted?
N
C
Y
S17
Coordinate data delete key operation conducted?
Y
N
S18
Display of input coordinate data
S19
Display of waveform with added point
S20
Deletion of coordinate data in selected cells
S21
Display of waveform excluding deleted point
D

Fig.19

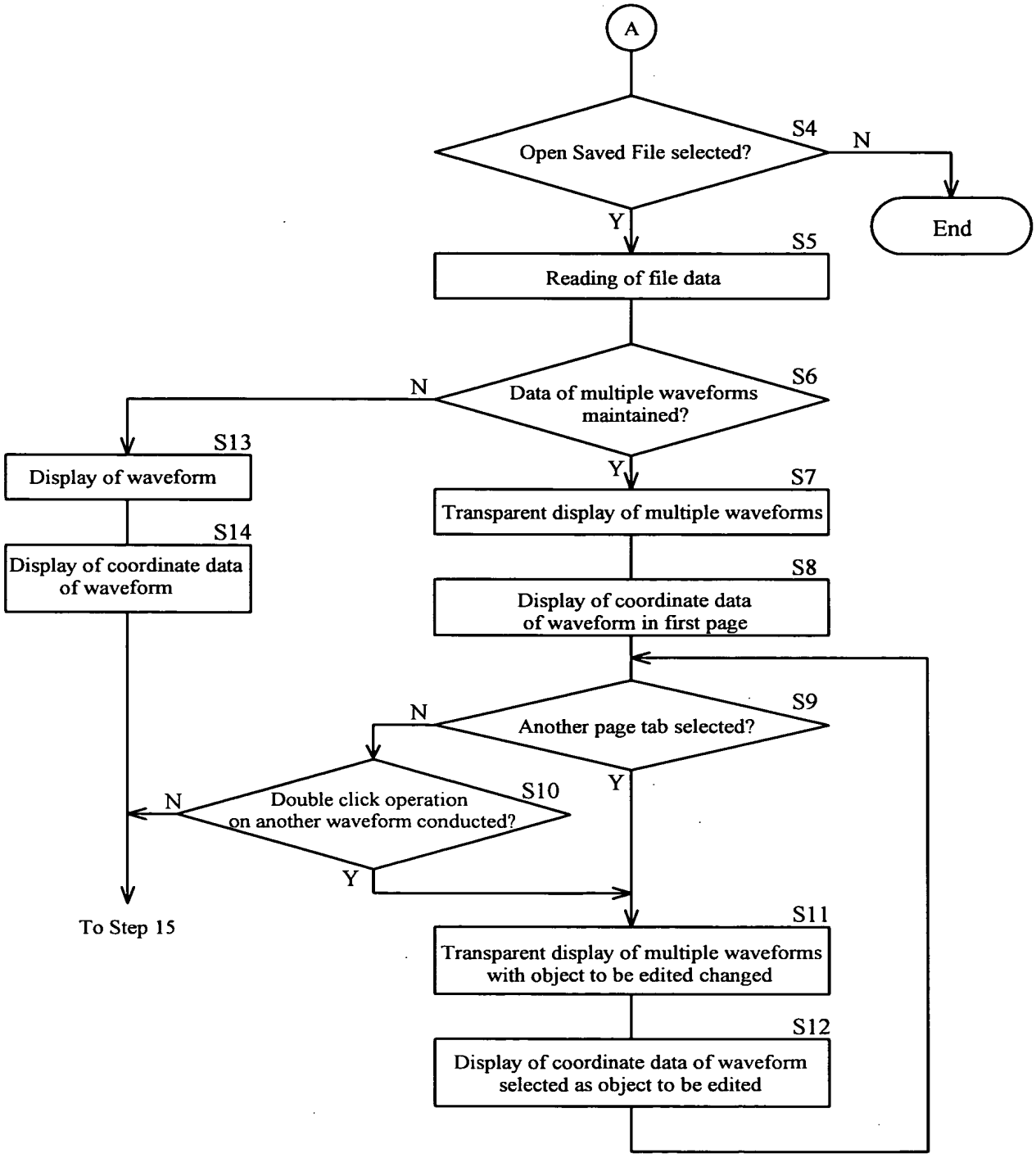

A
S4
Open Saved File selected?
N
End
Y
S5
Reading of file data
S6
Data of multiple waveforms maintained?
N
Y
S13
Display of waveform
S14
Display of coordinate data of waveform
S7
Transparent display of multiple waveforms
S8
Display of coordinate data of waveform in first page
S9
Another page tab selected?
N
Y
S10
Double click operation on another waveform conducted?
N
Y
To Step 15
S11
Transparent display of multiple waveforms with object to be edited changed
S12
Display of coordinate data of waveform selected as object to be edited

Fig.20

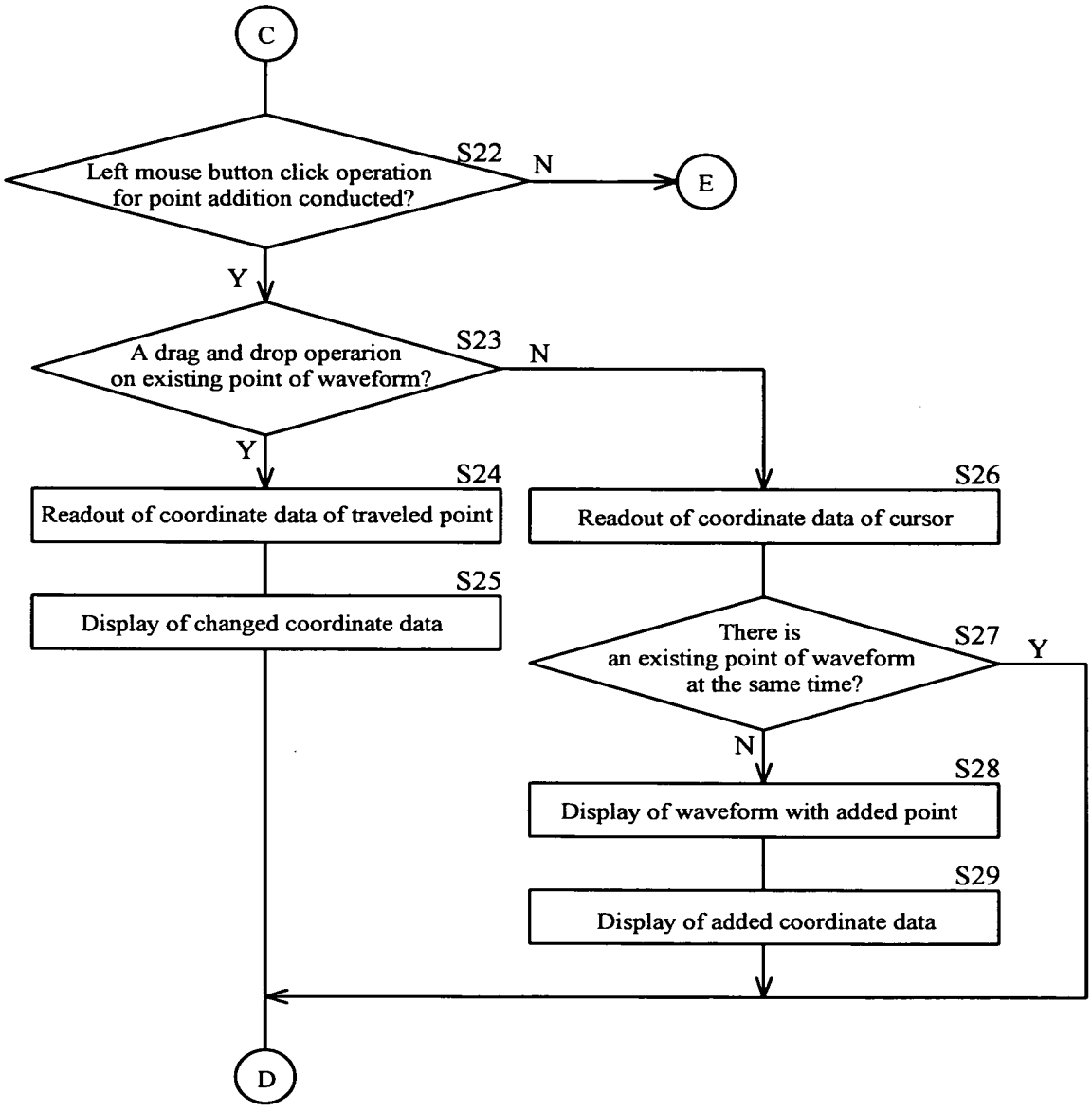

C
Left mouse button click operation for point addition conducted?
S22
N
E
Y
A drag and drop operarion on existing point of waveform?
S23
N
Y
S24
Readout of coordinate data of traveled point
S25
Display of changed coordinate data
S26
Readout of coordinate data of cursor
There is an existing point of waveform at the same time?
S27
Y
N
S28
Display of waveform with added point
S29
Display of added coordinate data
D

Fig.21

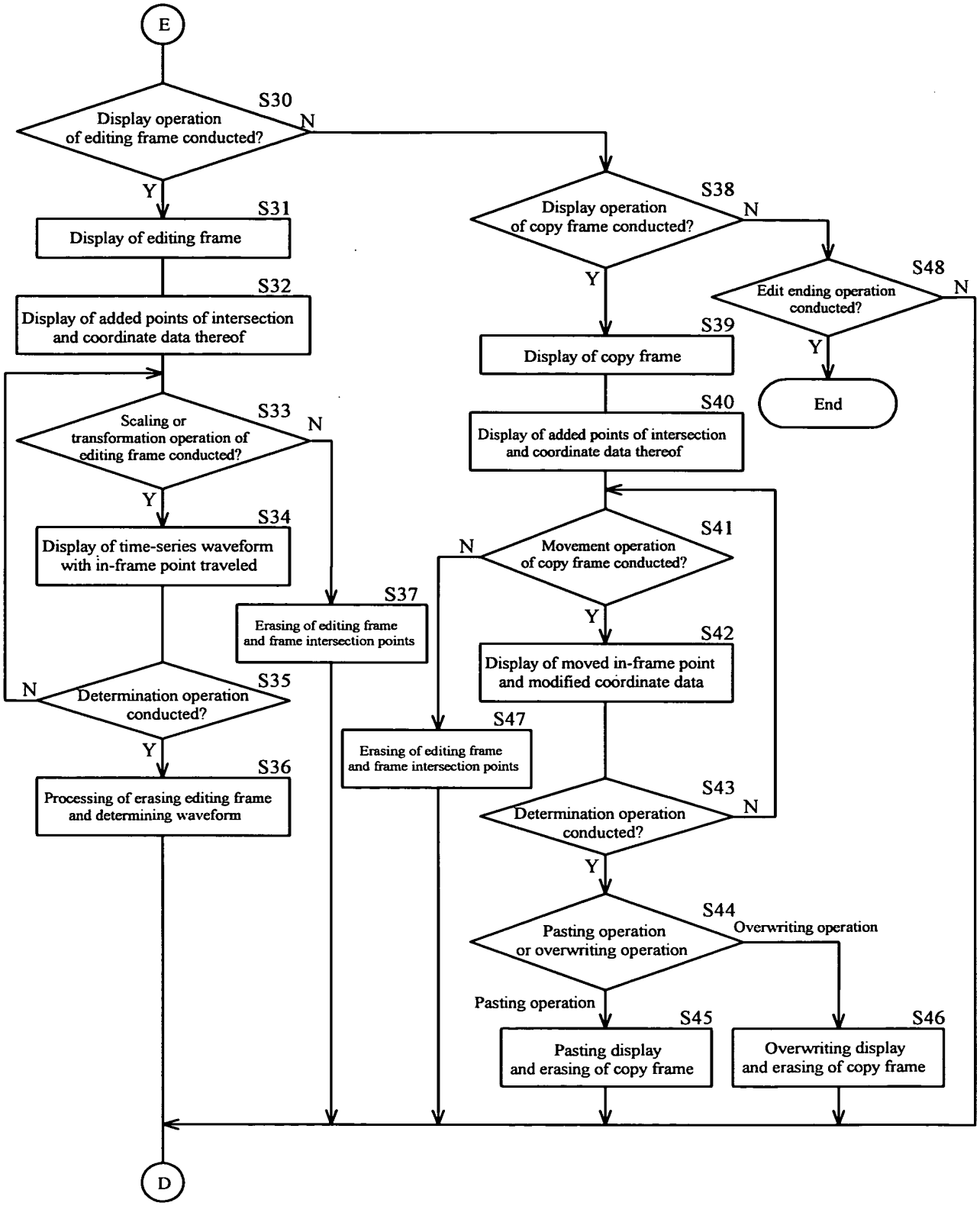

E
S30
Display operation of editing frame conducted?
N
Y
S31
Display of editing frame
S32
Display of added points of intersection and coordinate data thereof
S33
Scaling or transformation operation of editing frame conducted?
N
Y
S34
Display of time-series waveform with in-frame point traveled
S35
Determination operation conducted?
N
Y
S36
Processing of erasing editing frame and determining waveform
D
S37
Erasing of editing frame and frame intersection points
S38
Display operation of copy frame conducted?
N
Y
S39
Display of copy frame
S40
Display of added points of intersection and coordinate data thereof
S41
Movement operation of copy frame conducted?
N
Y
S42
Display of moved in-frame point and modified coordinate data
S43
Determination operation conducted?
N
Y
S44
Pasting operation or overwriting operation
Overwriting operation
Pasting operation
S45
Pasting display and erasing of copy frame
S46
Overwriting display and erasing of copy frame
S47
Erasing of editing frame and frame intersection points
S48
Edit ending operation conducted?
N
Y
End

Fig.22

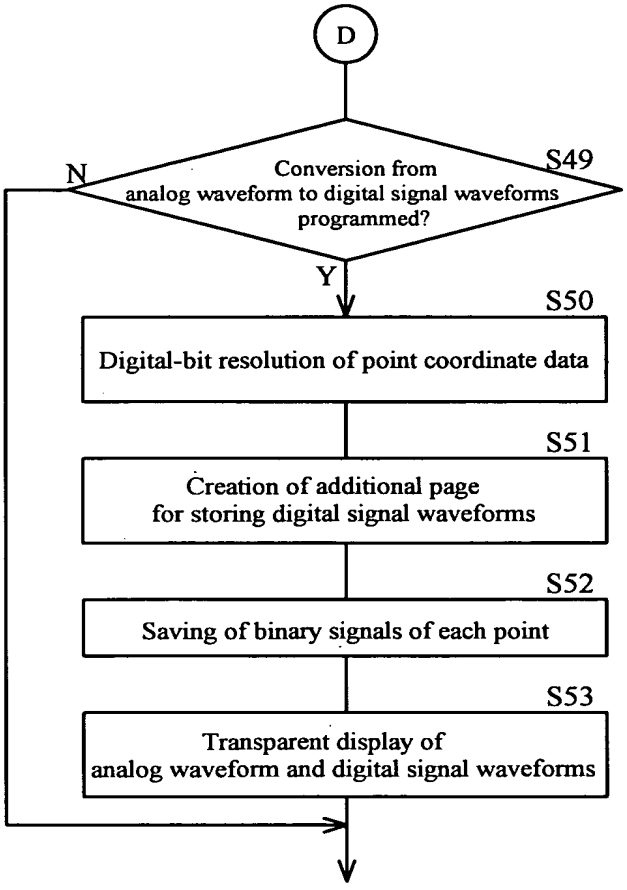

D
Conversion from analog waveform to digital signal waveforms programmed?
S49
N
Y
S50
Digital-bit resolution of point coordinate data
S51
Creation of additional page for storing digital signal waveforms
S52
Saving of binary signals of each point
S53
Transparent display of analog waveform and digital signal waveforms
Return to Step 16

Fig.23

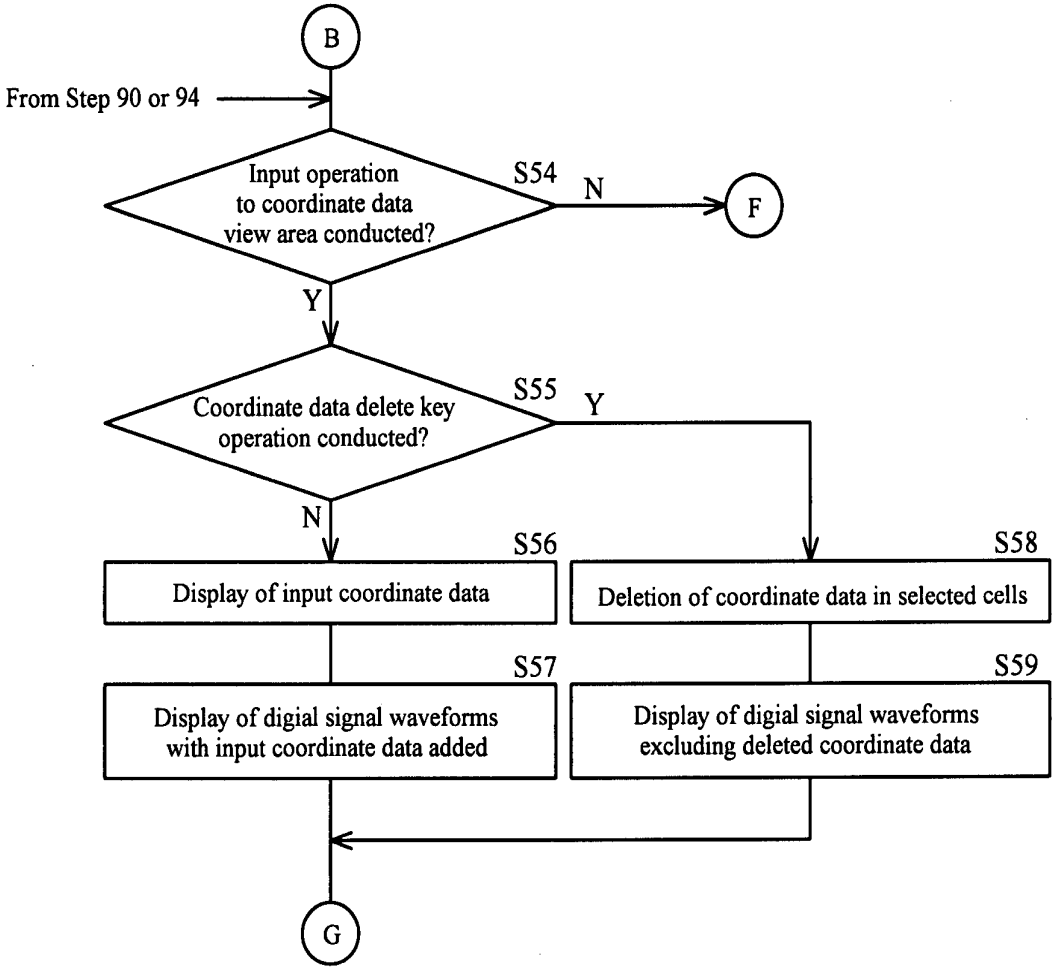

B
From Step 90 or 94
Input operation to coordinate data view area conducted?
S54
N
F
Y
Coordinate data delete key operation conducted?
S55
Y
N
S56
Display of input coordinate data
S58
Deletion of coordinate data in selected cells
S57
Display of digial signal waveforms with input coordinate data added
S59
Display of digial signal waveforms excluding deleted coordinate data
G

Fig.24

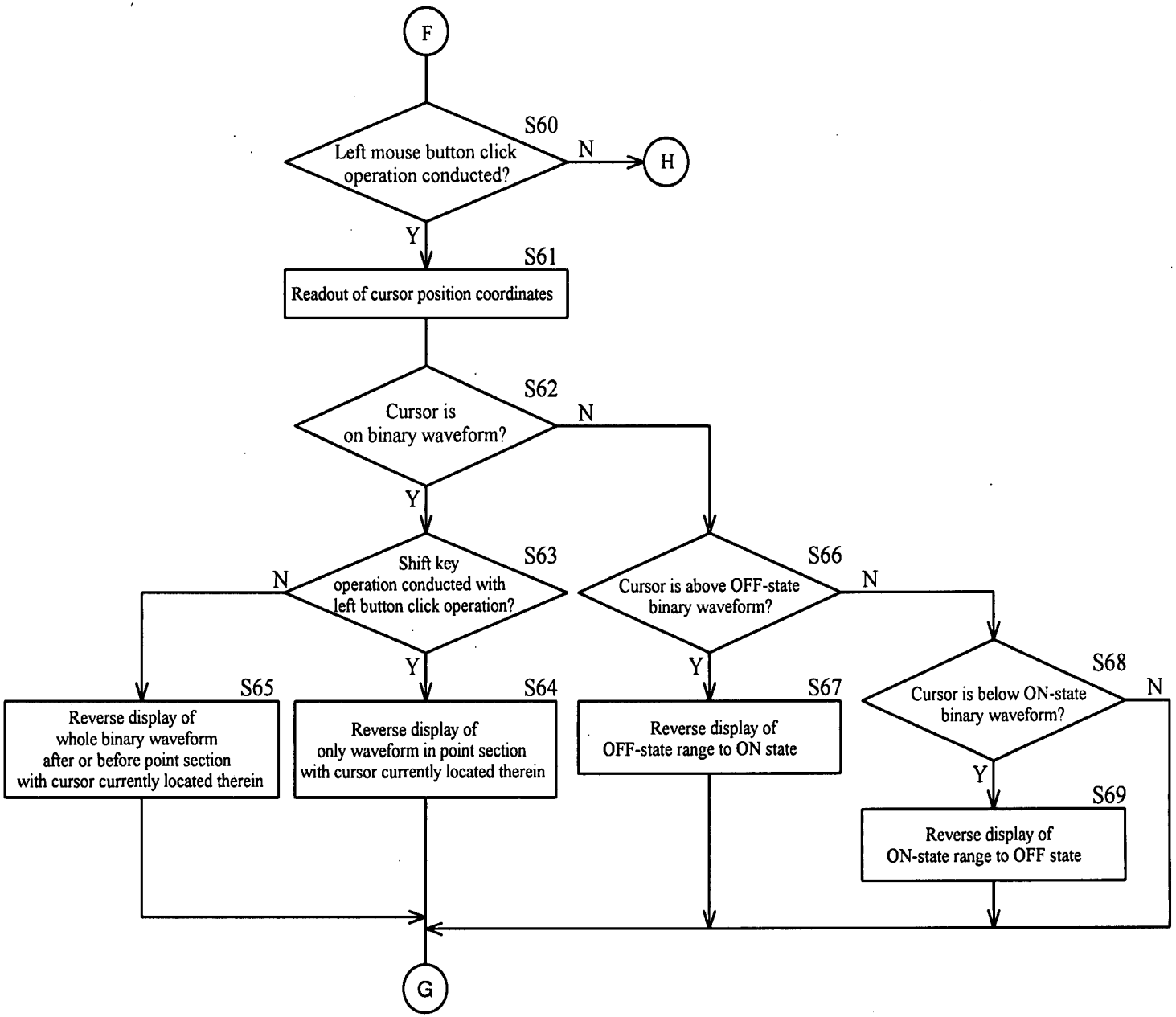

F
S60
Left mouse button click operation conducted?
N
H
Y
S61
Readout of cursor position coordinates
S62
Cursor is on binary waveform?
N
Y
S63
Shift key operation conducted with left button click operation?
N
Y
S66
Cursor is above OFF-state binary waveform?
N
Y
S68
Cursor is below ON-state binary waveform?
N
Y
S65
Reverse display of whole binary waveform after or before point section with cursor currently located therein
S64
Reverse display of only waveform in point section with cursor currently located therein
S67
Reverse display of OFF-state range to ON state
S69
Reverse display of ON-state range to OFF state
G

Fig.25

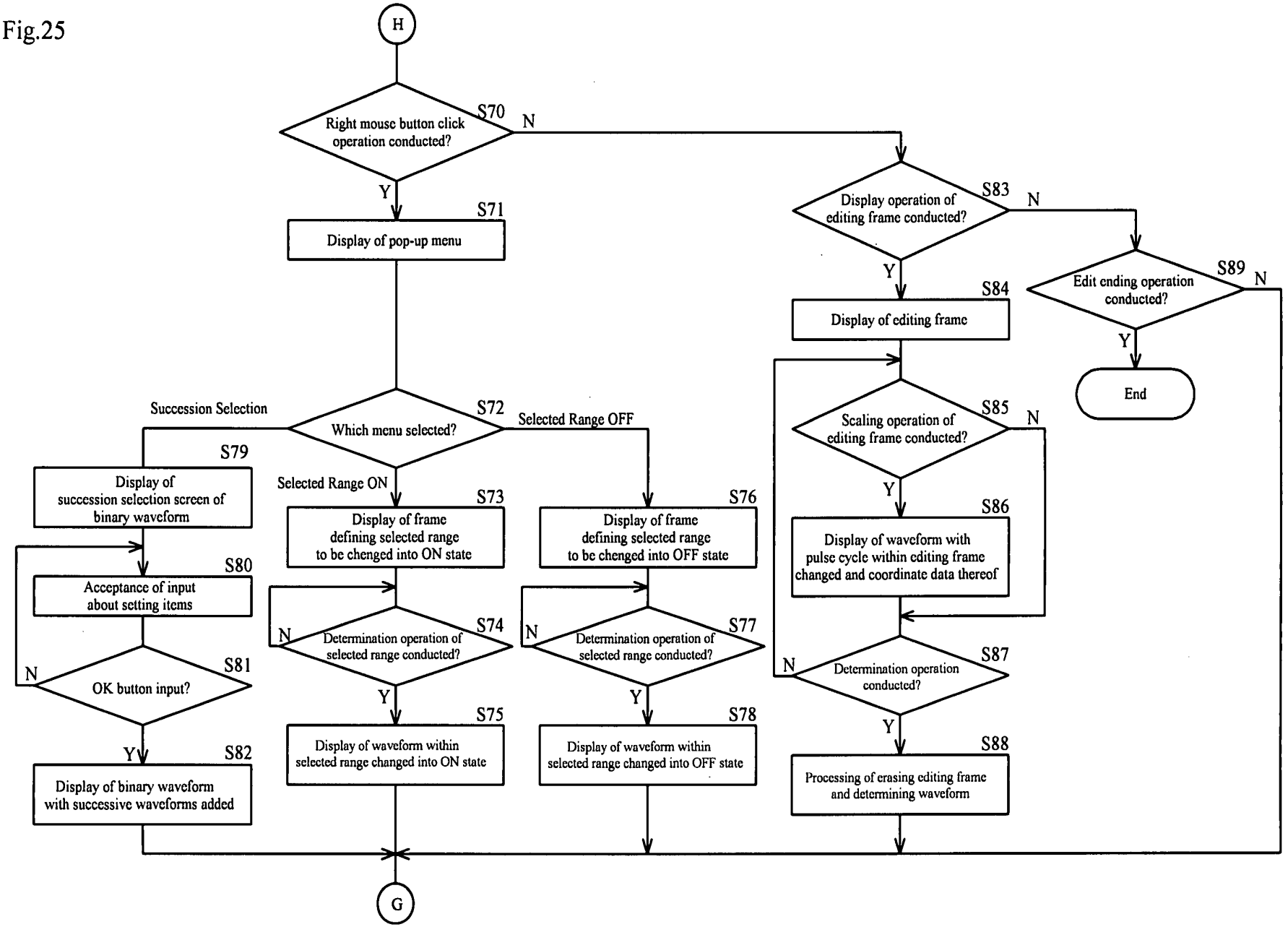

H
Right mouse button click operation conducted?
S70
N
Y
S71
Display of pop-up menu
Succession Selection
Which menu selected?
S72
Selected Range OFF
S79
Display of succession selection screen of binary waveform
Selected Range ON
S73
Display of frame defining selected range to be chenged into ON state
S76
Display of frame defining selected range to be chenged into OFF state
S80
Acceptance of input about setting items
N
Determination operation of selected range conducted?
S74
N
Determination operation of selected range conducted?
S77
S81
N
OK button input?
Y
Y
Y
S82
Display of binary waveform with successive waveforms added
S75
Display of waveform within selected range changed into ON state
S78
Display of waveform within selected range changed into OFF state
G
Display operation of editing frame conducted?
S83
N
Y
S84
Display of editing frame
Edit ending operation conducted?
S89
N
Y
End
Scaling operation of editing frame conducted?
S85
N
Y
S86
Display of waveform with pulse cycle within editing frame changed and coordinate data thereof
N
Determination operation conducted?
S87
Y
S88
Processing of erasing editing frame and determining waveform

Fig.26

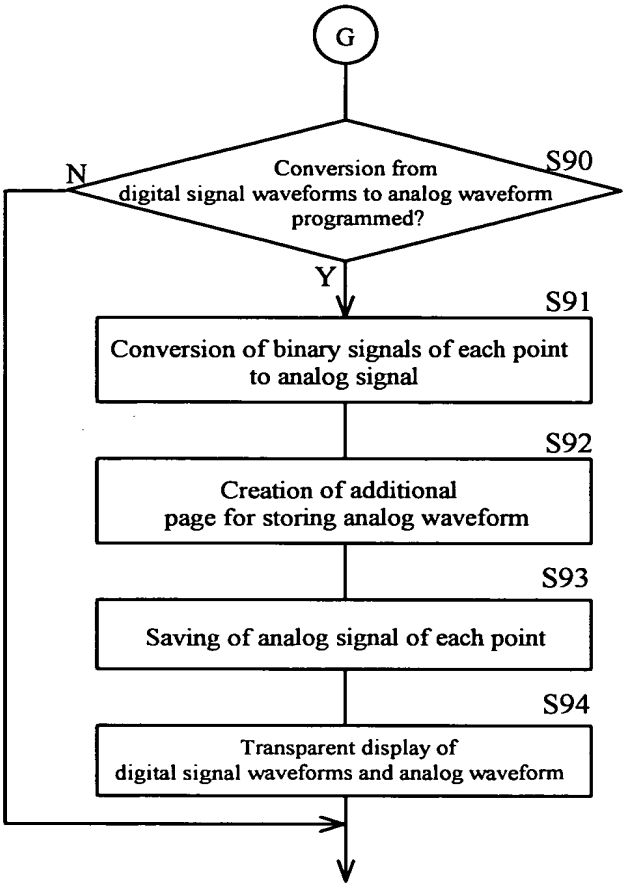
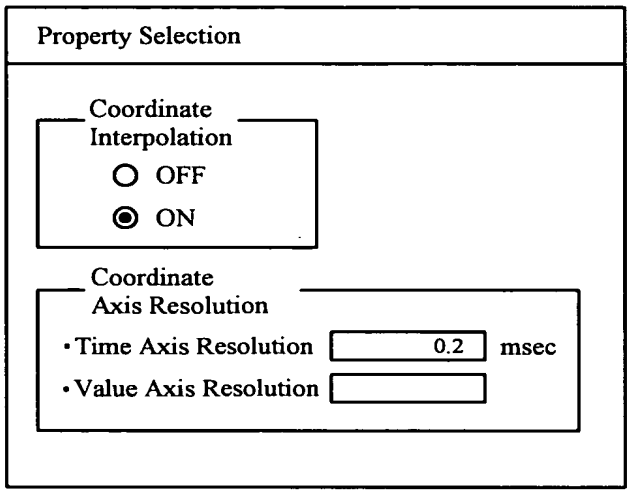

G
Conversion from digital signal waveforms to analog waveform programmed?
S90
N
Y
S91
Conversion of binary signals of each point to analog signal
S92
Creation of additional page for storing analog waveform
S93
Saving of analog signal of each point
S94
Transparent display of digital signal waveforms and analog waveform
return to Step 54

Fig.27


Property Selection
Coordinate Interpolation
OFF
ON
Coordinate Axis Resolution
• Time Axis Resolution
0.2
msec
• Value Axis Resolution